

## WHAT IS CLAIMED IS:

1. A vehicle steering apparatus comprising:  
a variable gear ratio device which includes an input shaft connected to a steering wheel side and an output shaft connected to a turning wheel side, and which  
5 changes a ratio between a steering angle input to the input shaft and a rotational angle output to the output shaft using rotation of a motor;  
a rotation detecting device which repeatedly outputs, as the motor rotates, a series of a predetermined number of different signals, the signals differing according to the rotation of the motor, so as to detect a rotational position of a rotating  
10 shaft of the motor; and  
a lock mechanism including a lock holder which rotates together with the rotating shaft of the motor, and in which plural indented portions are formed at an outer periphery portion thereof, and an engagement member which is fitted on a stator side of the motor, the lock mechanism restricting relative rotation of the input shaft  
15 and the output shaft by inserting the engagement member in one of the indented portions, wherein a play angle between the engagement member and the indented portion when the engagement member is inserted in the indented portion is smaller than a first rotational angle of the motor which is required for outputting all of the predetermined number of different signals.  
20
2. The vehicle steering apparatus according to claim 1, wherein the play angle is smaller than a second rotational angle of the motor which is required for outputting all of the signals, the number of which is smaller than the predetermined number by one.  
25
3. The vehicle steering apparatus according to claim 1, wherein a third rotational angle of the motor which is required for outputting each of the signals is the same.
- 30 4. The vehicle steering apparatus according to claim 3, wherein the third rotational angle is 15 degrees.
5. The vehicle steering apparatus according to claim 1, wherein protruding portions, each of which is formed between the indented portions adjacent

to each other, has a width that is equal to or larger than a width equivalent to the third rotational angle.

5           6.           The vehicle steering apparatus according to claim 1, wherein the lock holder and the rotating shaft rotate with respect to each other when torque that is equal to or larger than a predetermined value is applied to the lock holder.

10           7.           The vehicle steering apparatus according to claim 1, wherein the rotation detecting device includes plural magnets which are fitted on the rotating shaft side, and which integrally rotate with the rotating shaft; and plural detectors which are provided along outer peripheries of the plural magnets, and which detect directions of magnetic fields of the plural magnets.

15           8.           The vehicle steering apparatus according to claim 7, wherein the plural detectors are provided in a width of a magnetic pole of one of the magnets in a width direction.

20           9.           The vehicle steering apparatus according to claim 1, wherein the rotation detecting device outputs the series of the predetermined number of different signals a plurality of times while the motor rotates 360 degrees.

25           10.          A vehicle steering apparatus comprising:  
                    variable gear ratio means for changing a ratio between a steering angle input to an input shaft connected to a steering wheel side and a rotational angle output to an output shaft connected to a turning wheel side using rotation of a motor;  
                    rotation detecting means for repeatedly outputting, as the motor rotates, a series of a predetermined number of different signals, the signals differing according to the rotation of the motor, so as to detect a rotational position of a rotating shaft of the motor; and  
30                      a lock mechanism including a lock holder which rotates together with the rotating shaft of the motor, and in which plural indented portions are formed at an outer periphery portion thereof, and an engagement member which is fitted on a stator side of the motor, the lock mechanism restricting relative rotation of the input shaft and the output shaft by inserting the engagement member in one of the indented

portions, wherein a play angle between the engagement member and the indented portion when the engagement member is inserted in the indented portion is smaller than a first rotational angle of the motor which is required for outputting all of the predetermined number of different signals.